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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,590	06/24/2003	Steven T. Fink	239337US6YA	8442

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EXAMINER

ALEJANDRO MULERO, LUZ L

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 03/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/601,590	Applicant(s) FINK, STEVEN T.	
	Examiner Luz L. Alejandro	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 41-44 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 41-44 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, 4-5 and 41 are rejected under 35 U.S.C. 102(b) as being anticipated by Boulos et al., US 5,560,844 or, in the alternative, under 35 U.S.C. 103(a) as obvious over Boulos et al., US 5,560,844 in view of Hull, US 4,431,901.

Boulos et al. discloses a plasma source assembly comprising: an outer shield comprising a plurality of plates 2/13; a dielectric chamber wall 9; a helical coil 3 provided between the outer shield and the dielectric chamber wall; a coil insulator 11 coupled to at least one coil turn of the helical coil and between adjacent coil turns of the helical coil; wherein the dielectric chamber wall and the outer shield define a resonator

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cavity (the space comprise by conduit 30, the coil and conduit 22/25); and means 26-36 for circulating cooling fluid throughout the resonator cavity (see, for example, fig. 1 and its description). It is inherent that the cooling conduits 30-36 are rods, alternatively, Hull discloses an apparatus comprising cooling rods for introducing and circulating cooling fluid in the apparatus (see, for example, fig. 1 and its description). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Boulos et al. as to further comprise cooling rods, as taught by Hull, since such a structure is known and used in the art to introduce and circulate cooling fluid in an apparatus.

Furthermore, note that the cooling rod(s) of the apparatus of Boulos et al. or the cooling rod(s) apparatus of Boulos et al. modified by Hull is coupled to the coil insulator to hold the coil insulator and the at least one coil turn in a predetermined position.

Claims 3 and 42-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boulos et al., US 5,560,844 or Boulos et al., US 5,560,844 in view of Hull, US 4,431,901.

Boulos et al. and Hull are applied as above. Additionally, it would have been an obvious choice of design to one having ordinary skill in the art at the time the invention was made to space the turns of the coil as needed in order to achieve a desired resonance frequency.

With respect to claims 42-44, the coil insulator of the apparatus of Boulos et al. or the apparatus of Boulos et al. modified by Hull provides predetermined spacing between

the coil turns. Furthermore, a prima facie case of obviousness still exists because making elements separable was held to have been obvious and such limitation would not lend patentability to the instant application absent the showing of unexpected results. Furthermore, there is not evidence that the choice of a particular configuration of the coil insulator would significantly affect the overall performance of the plasma processing apparatus.

Claims 6 and 8-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boulos et al., US 5,560,844 in view of Hull, US 4,431,901.

Boulos et al. and Hull are applied as above but does not expressly disclose a plenum cooling plate defining a manifold configured to supply cooling fluid to the resonator cavity. Hull discloses an inductive plasma apparatus comprising plenum cooling plate 18/20 defining a manifold to supply and receive cooling fluid (see for example, fig. 1 and its description). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Boulos et al. as to further comprise the claimed cooling fluid supply structure since such arrangement is known in the art to be suitable for supplying cooling fluid in a plasma apparatus.

Regarding claims 8-13, note that the apparatus of Boulos et al. modified by Hull will comprise a plenum cooling plate configured to supply cooling fluid to a first cooling rod provided within the resonator cavity, the first cooling rod being provided radially outside the helical coil and having at least one outlet hole configured to discharge the

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cooling fluid in a circumferential direction within the resonator cavity; the plenum cooling plate is configured to receive cooling fluid from a second cooling rod provided within the resonator cavity, the second cooling rod is provided radially inside the helical coil and has at least one inlet hole configured to receive the cooling fluid from within the resonator cavity; a spacer is provided between the first cooling rod and the second cooling rod; and insulators (the insulating material around the coil) abutting the spacer and provided between the first cooling rod and the second cooling rod, wherein the coil insulators have holes configured to receive the helical coil.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Boulos et al., US 5,560,844 in view of Hull, US 4,431,901, as applied to claims 6 and 8-13 above, and further in view of Komino, US 5,584,971.

Boulos et al. and Hull et al. are applied as above and Boulos et al. further discloses means for removing bubbles from the cooling fluid (note that cooling fluid permeate through dielectric wall 9, also note parallel conduits 34). Additionally, Komino discloses a plasma apparatus which comprising cooling means and means for removing bubbles from the cooling fluid (see, for example, col. 15, lines 1-29). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Hull or the apparatus of Boulos et al. modified by Hull as to further comprise means for removing bubbles from the cooling fluid in order to avoid that: a) the bubbles rise to the surface of the cooling medium all at once, b) the liquid level is unstable, c) the uneven temperature difference.

Additionally, and with respect to the claimed coil/cavity/plenum arrangement there is not evidence that the choice of a particular coil/cavity/plenum arrangement would significantly affect the overall performance of the plasma processing apparatus.

Claims 1, 4-5 and 41 are rejected under 35 U.S.C. 102(b) as being anticipated by Edamura et al., US 6,245,202 or Edamura et al., WO 97/39607.

Edamura et al. discloses a plasma source assembly comprising: an outer shield 25c; a dielectric chamber wall 29; a helical coil 9 provided between the outer shield and the dielectric chamber wall; a coil insulator 25b coupled to at least one coil turn of the helical coil and between adjacent coil turns of the helical coil; wherein the dielectric chamber wall and the outer shield define a resonator cavity; means for circulating cooling fluid throughout the resonator cavity including cooling rods 27a/27b coupled to the coil insulator to hold the coil insulator and the at least one coil turn in a predetermined position means for circulating cooling fluid throughout the resonator cavity (see, for example, fig. 7 and its description).

Claims 2-3 and 42-44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edamura et al., US 6,245,202 or Edamura et al., WO 97/39607.

Edamura et al. is applied as above but does not expressly disclose that the outer shield comprises a plurality of plates. However, a prima facie case of obviousness still exists because duplication of parts was held to have been obvious and such limitation would not lend patentability to the instant application absent the showing of unexpected

results. Additionally, there is not evidence that the choice of a particular configuration of the shield would significantly affect the overall performance of the plasma processing apparatus.

Also, it would have been an obvious choice of design to one having ordinary skill in the art at the time the invention was made to space the turns of the coil as needed in order to achieve a desired resonance frequency.

With respect to claims 42-44, the coil insulator of the apparatus of Edamura et al. provides predetermined spacing between the coil turns. Furthermore, a prima facie case of obviousness still exists because making elements separable was held to have been obvious and such limitation would not lend patentability to the instant application absent the showing of unexpected results. Furthermore, there is not evidence that the choice of a particular configuration of the coil insulator would significantly affect the overall performance of the plasma processing apparatus.

Claims 6 and 8-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Edamura et al., WO 97/39607 in view of Hull, US 4,431,901.

Edamura et al. is applied as above but does not expressly disclose a plenum cooling plate defining a manifold configured to supply cooling fluid to the resonator cavity. Hull discloses an inductive plasma apparatus comprising plenum cooling plate 18/20 defining a manifold to supply and receive cooling fluid (see for example, fig. 1 and its description). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Edamura et al. as

to further comprise the claimed cooling fluid supply structure since such arrangement is known in the art to be suitable for supplying cooling fluid in a plasma apparatus.

Regarding claims 8-13, note that the apparatus of Edamura et al. modified by Hull will comprise a plenum cooling plate configured to supply cooling fluid to a first cooling rod provided within the resonator cavity, the first cooling rod being provided radially outside the helical coil and having at least one outlet hole configured to discharge the cooling fluid in a circumferential direction within the resonator cavity; the plenum cooling plate is configured to receive cooling fluid from a second cooling rod provided within the resonator cavity, the second cooling rod is provided radially inside the helical coil and has at least one inlet hole configured to receive the cooling fluid from within the resonator cavity; a spacer is provided between the first cooling rod and the second cooling rod; and insulators (the insulating material around the coil) abutting the spacer and provided between the first cooling rod and the second cooling rod, wherein the coil insulators have holes configured to receive the helical coil.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Edamura et al., WO 97/39607 in view of Hull, US 4,431,901, as applied to claims 6 and 8-13 above, and further in view of Komino, US 5,584,971.

Edamura et al. and Hull do not expressly disclose that the apparatus further comprises means for removing bubbles from the cooling fluid. Komino discloses a plasma apparatus which comprising cooling means and means for removing bubbles from the cooling fluid (see, for example, col. 15, lines 1-29). Therefore, it would have

been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Hull or the apparatus of Edamura et al. modified by Hull as to further comprise means for removing bubbles from the cooling fluid in order to avoid that: a) the bubbles rise to the surface of the cooling medium all at once, b) the liquid level is unstable, c) the uneven temperature difference.

Additionally, and with respect to the claimed coil/cavity/plenum arrangement there is not evidence that the choice of a particular coil/cavity/plenum arrangement would significantly affect the overall performance of the plasma processing apparatus

Response to Arguments

Applicant's arguments with respect to claims 1-13 and 41-44 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luz L. Alejandro whose telephone number is 571-272-1430. The examiner can normally be reached on Monday to Thursday from 7:30 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Luz L. Alejandro
Primary Examiner
Art Unit 1763

March 2, 2006